

09/814,099

Claims 1 - 3 and 11 - 13 are presently being examined. Claims 4 - 10 are withdrawn from consideration at this time as being non-elected claims of a restriction requirement.

The applicant thanks the Examiner for now indicating that claims 2, 3, 12 and 13 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The applicant respectfully submits herewith amended claims 2, 3, 12 and 13 in independent forms. Such claims should now be allowable.

The specification has been objected to due to certain informalities, which the Examiner deemed needed correction, as set forth in item 3, page 3 of the outstanding Action. The applicant respectfully requests reconsideration of these objections.

The applicant respectfully submits that the amendments to the specification, filed herewith, obviate the outstanding objections to the specification. For example, the amendment in line 24, page 30 of the applicant's specification exactly corresponds to "Nt \rangle Ntm" shown in the step in the applicant's Figure 5.

Accordingly, the withdrawal of the outstanding objections to the specification is in order, and is therefore respectfully solicited.

09/814,099

The Examiner has indicated that an Information Disclosure Statement has not been filed and that the Japanese Patent Publication No. 2000-96601, mentioned in the present specification at page 2, line 9, has not been considered.

In response, the applicant respectfully submits herewith a copy of the Information Disclosure Statement (IDS) filed with the above-captioned patent application on March 22, 2001, along with a copy of the return receipt card with the U.S. PTO date stamp indicating that, in fact, the U.S. PTO received such IDS. The IDS filed on March 22, 2001 included a copy of Japanese Patent Publication No. 2000-96601.

FIG. 5 is objected to for the specific reasons set forth in item 2, pages 2 and 3 of the outstanding Office Action. The applicant respectfully requests reconsideration of these objections.

Submitted herewith is a Request for Approval of Drawing Corrections, along with proposed drawing corrections to FIG. 5 in handwritten form. The applicant respectfully submits that because "Em < Em", "YES" and "NO" shown in the step 7 correspond with details disclosed in the applicant's specification (page 28, lines 10 - 19); i.e., "YES" represents that Em is smaller than EM1 and proceeding for the step 8, and "NO" shows that Em is equal to or more than Em1 and proceeding for the step 10.

09/814,099

The applicant respectfully requests that the proposed drawing corrections submitted herewith be approved by the Examiner.

Claim 11 is objected to because lines 31 - 32 should read "the boom lever operating amount changed to a zero amount from a predetermined operating amount" (emphasis in original). The applicant's amendment to claim 11 should overcome the Examiner's objection.

As to the merits of this case, claims 1 and 11 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kinugawa et al. (U.S. Patent 5,999,872). The applicant respectfully requests reconsideration of this rejection.

Kinugawa et al. describes control apparatus for a hydraulic excavator. The excavator has a boom cylinder (4), a boom control valve (11), a boom lever (17), a boom lever operating amount detector (25), a bucket cylinder (6), a bucket control valve (12), a bucket lever (18), and a bucket lever operating amount detector (26). An excavating state detecting means for detecting an excavating state of the vehicle is described at col. 14, lines 22-39. It is alleged by the Examiner that an automatic excavation control means that sets and outputs an automatic command value to each of the control valves on the basis of judgment of the load judging portion is disclosed at col. 25, lines 54-59, col. 31, lines 2-7, and col. 36, lines 40-46; however, the applicant respectfully submits that such disclosure is not found at those portions of the specification.

09/814,099

The Examiner states that Kinugawa does not explicitly disclose a controller for outputting a boom control command value on the basis of data from the boom and bucket lever operating amount detector, and an automatic excavation control means for setting and outputting an automatic excavation command value to each of the control valve. However, the Examiner alleges that using a controller and an automatic excavating control means to provide automatic control to the valves would have been well known to a person of ordinary skill in the art.

Regarding claim 11, the Examiner refers to the above discussion relating to claim 1; and in addition, alleges that Kinugawa teaches an operating amount change judging portion for judging that the boom lever operating amount changes to a zero amount from a predetermined operating amount, at col. 35, lines 21-34.

Lines 18 - 34, column 35 in Kinugawa state that:

in the crane work and the loading work, all the operating levers 17-22 are often operated in the neutral position continuously for a certain period of time during the work. However, in these works, since the auto acceleration control is invalid, it is possible to avoid the situation that the engine speed is controlled to a low speed In work other than those mentioned above, since the auto acceleration control is effective, if an operator returns all the operating levers 17-22 to their neutral position and stops the work, the engine speed is soon controlled to a low speed... .

On the other hand, the applicant's claimed invention teaches that the automatic excavation control means outputs the automatic excavation command value to each of the control valves (Step 7) when the load judging portion judges that the vehicle is under excavation (Step 2) and the operating amount change judging portion judges that boom lever operating amount changes from

09/814,099

a predetermined operating amount to a zero amount (Step 5), as shown in Fig. 9.

Such claimed structural arrangements are not disclosed in Kinugawa, and such claimed structural arrangements would not have been obvious to a person of ordinary skill in the art under 35 U.S.C. §103(a) based on Kinugawa.

In view of the above, the withdrawal of the outstanding obviousness rejection under 35 U.S.C. §103(a) based on Kinugawa et al. (U.S. Patent 5,999,872) is in order, and is therefore respectfully solicited.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the applicant's undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

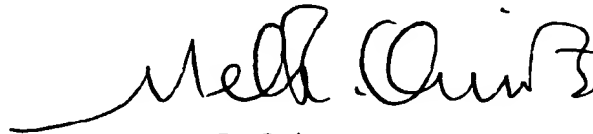
Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "Version with markings to show changes made."

09/814,099

In the event that this paper is not timely filed, the applicant respectfully petitions for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

ARMSTRONG, WESTERMAN & HATTORI, LLP



Mel R. Quintos
Attorney for Applicant
Reg. No. 31,898

MRQ/ipc

Atty. Docket No. 010270
Suite 1000, 1725 K Street, N.W.
Washington, D.C. 20006
(202) 659-2930



23850

PATENT TRADEMARK OFFICE

Enclosures: Version with markings to show changes made
Request for Approval of Drawing Corrections (w/ marked-up FIG. 5)
Information Disclosure Statement filed 3/22/01
Return Receipt Card w/ U.S. PTO date-stamp

H:\HOME\MEL\TRANSFER\010270 AMENDMENT due 8-22-02

VERSION WITH MARKINGS TO SHOW CHANGES MADE 09/814,099

IN THE SPECIFICATION:

Paragraph beginning at page 1, line 9 has been amended as follows:

As a construction machine performing an excavating and loading operation, there is a wheel loader having a bucket in a front portion of a vehicle and mainly excavating a loaded object such as crushed stones and rocks, earth and sand, or the like by the bucket so as to load on a [damp] dump truck or the like. Fig. [9]10 shows a [wholly] side elevation view of the wheel loader.

Paragraph bridging pages 1 and 2 (line 16, page 1 through line 4, page 2) has been amended as follows:

In Fig. [9] 10, a wheel loader 1 is provided with a working unit 5 having a boom 3 attached to a front portion of a travelable vehicle body 2 in such a manner as to freely move in a vertical direction, and a bucket 4 pivoted to a front end portion of boom 3 in such a manner as to freely rotate in a vertical direction. The boom 3 and the bucket 4 are operated by operating levers (not shown) provided within an operating room 7 mounted on the vehicle body 2. At a time of excavating a loaded object 6 so as to load on the bucket, the boom operation and the bucket operation are alternately performed while forward moving the vehicle toward a heap of the loaded object 6. In this case, rotating the bucket 4 around a pin 8 in a clockwise direction in Fig. [9]10 is called [as] a tilting operation.

09/814,099

Paragraph bridging pages 20 and 21 (line 25, page 20 through line 11, page 21) has been amended as follows:

Fig. 1 shows a side elevational view of a working unit 5 of a wheel loader 1. A base end portion of a boom 3 is rotatably attached to a vehicle body 2 by a pin 7, and the vehicle body 2 and the boom 3 are connected to a boom cylinder 10. When the boom cylinder 10 is extended, the boom 3 is rotated around the pin 7 so as to be ascended, and when the boom cylinder 10 is compressed, the boom 3 is descended. Further, a bucket 4 is rotatably attached to a front end portion of the boom 3 by a pin 8, and the bucket 4 and the boom 3 are connected via a link 9 by a bucket cylinder 11. When the bucket cylinder 11 is extended, the bucket 4 is titled, and when the bucket cylinder 11 is compressed, the bucket 4 is [damped]dumped.

Paragraph beginning at page 22, line 4 has been amended as follows:

The boom control valve 13 is a four position switching valve having an A (boom ascending) position, a B (neutral) position, a C (boom descending) position and a D (floating) position, and the bucket control valve 14 is a three position switching valve having an E (tilt) position, an F (neutral) position and a G [(damp)](dump) position.

Paragraph beginning at page 22, line 10 has been amended as follows:

Pilot pressure receiving portions of the boom control valve 13 and the bucket control valve 14 are respectively connected to a pilot pump 15 via an electromagnetic proportional command valve 20. The electromagnetic proportional command valve 20 is constituted by a boom descending command valve 21, a boom ascending command valve 22, a bucket [damp] dump command valve

09/814,099

23 and a bucket tilt command valve 24.

Paragraph bridging pages 22 and 23 (line 27, page 22 through line 5, page 23) has been amended as follows:

A boom lever operating amount detector 31 detecting a boom lever operating amount Em is attached to a boom lever 30. Further, a bucket lever operating amount detector 33 detecting a bucket lever operating amount Et is attached to a bucket lever 32. Detecting signals of the respective detectors 31 and [32]33 are input to the controller 25.

Paragraph beginning at page 30, line 24 has been amended as follows:

(4) A tilt number Nt is [equal to or more] larger than a predetermined tilt number threshold Ntm.

IN THE CLAIMS:

Amend claims 2, 3, 11, 12 and 13 as follows:

2. (Amended) A working unit control apparatus of an excavating and loading machine [as claimed in claim 1] comprising:

a boom cylinder controlling a lift of a boom;

a boom control valve controlling extension and compression of the boom cylinder;

a boom lever instructing an extension and compression speed of the boom cylinder;

a boom lever operating amount detector detecting an operating amount of the boom lever;

a bucket cylinder controlling a tilt of the bucket;

a bucket control valve controlling an extension and compression of the bucket cylinder;

a bucket lever instructing an extension and compression speed of the bucket cylinder;

a bucket lever operating amount detector detecting an operating amount of the bucket lever;

and

a controller outputting a boom control command value to the boom control valve on the basis of the boom lever operating amount input from the boom lever operating amount detector, and outputting a bucket control command value to the bucket control valve on the basis of the bucket lever operating amount input from the bucket lever operating amount detector, wherein;

said working unit control apparatus has excavating state detecting means detecting an excavating state of a vehicle,

09/814,099

said controller has a load judging portion judging on the basis of a detecting amount input from the excavating state detecting means whether or not the vehicle is under excavation, and automatic excavation control means setting and outputting an automatic excavation command value to each of the control valves on the basis of the judgment of said load judging portion, and the automatic excavation control means judges an automatic excavation start when the boom lever is operated and said load judging portion judges that the vehicle is under excavation.

the excavating state detecting means is constituted by a vehicle speed detector detecting a vehicle speed and an engine rotational speed detector detecting an engine rotational speed, and

[wherein] the load judging portion is structured such as to judge that the vehicle is under excavation when the vehicle speed is equal to or less than a value shown by a predetermined curve relating to the engine rotational speed.

3. (Amended) A working unit control apparatus of an excavating and loading machine [as claimed in claim 1] comprising:

a boom cylinder controlling a lift of a boom;

a boom control valve controlling extension and compression of the boom cylinder;

a boom lever instructing an extension and compression speed of the boom cylinder;

a boom lever operating amount detector detecting an operating amount of the boom lever;

a bucket cylinder controlling a tilt of the bucket;

a bucket control valve controlling an extension and compression of the bucket cylinder;

09/814,099

a bucket lever instructing an extension and compression speed of the bucket cylinder;

a bucket lever operating amount detector detecting an operating amount of the bucket lever;

and

a controller outputting a boom control command value to the boom control valve on the basis of the boom lever operating amount input from the boom lever operating amount detector, and outputting a bucket control command value to the bucket control valve on the basis of the bucket lever operating amount input from the bucket lever operating amount detector, wherein:

said working unit control apparatus has excavating state detecting means detecting an excavating state of a vehicle,

said controller has a load judging portion judging on the basis of a detecting amount input from the excavating state detecting means whether or not the vehicle is under excavation, and automatic excavation control means setting and outputting an automatic excavation command value to each of the control valves on the basis of the judgment of said load judging portion, and the automatic excavation control means judges an automatic excavation start when the boom lever is operated and said load judging portion judges that the vehicle is under excavation,

the excavating state detecting means is constituted by an accelerator pedal operating amount detector detecting an accelerator pedal operating amount and an engine rotational speed detector detecting an engine rotational speed, and

[wherein] the load judging portion is structured such as to judge that the vehicle is under excavation when the accelerator pedal operating amount is equal to or more than a predetermined

operating amount and the engine rotational speed is equal to or less than a predetermined rotational speed.

11. (Amended) A working unit control apparatus of an excavating and loading machine comprising:

a boom cylinder controlling a lift of a boom;

a boom control valve controlling extension and compression of the boom cylinder;

a boom lever instructing an extension and compression speed of the boom cylinder;

a boom lever operating amount detector detecting an operating amount of the boom lever;

a bucket cylinder controlling a tilt of the bucket;

a bucket control valve controlling an extension and compression of the bucket cylinder; and

a bucket lever instructing an extension and compression speed of the bucket cylinder;

a bucket lever operating amount detector detecting an operating amount of the bucket lever;

and

a controller outputting a boom control command value to the boom control valve on the basis of the boom lever operating amount input from the boom lever operating amount detector, and outputting a bucket control command value to the bucket control valve on the basis of the bucket lever operating amount input from the bucket lever operating amount detector,

wherein said working unit control apparatus has excavating state detecting means detecting an excavating state of a vehicle,

09/814,099

wherein said controller has a load judging portion judging on the basis of a detecting amount input from the excavating state detecting means whether or not the vehicle is under excavation, an operating amount change judging portion judging that the boom lever operating amount changed [at] to a zero amount from a predetermined operating amount, and automatic excavation control means setting and outputting an automatic excavation command value to each of the control valves on the basis of the judgment of said load judging portion and said operating amount change judging portion, and

wherein the automatic excavation control means outputs the automatic excavation command value to each of the control valves when said load judging portion judges that the vehicle is under excavation and said operating amount change judging portion judges that the boom lever operating amount changes from a predetermined operating amount to a zero amount.

12. (Amended) A working unit control apparatus of an excavating and loading machine [as claimed in claim 11] comprising:

a boom cylinder controlling a lift of a boom;

a boom control valve controlling extension and compression of the boom cylinder;

a boom lever instructing an extension and compression speed of the boom cylinder;

a boom lever operating amount detector detecting an operating amount of the boom lever;

a bucket cylinder controlling a tilt of the bucket;

a bucket control valve controlling an extension and compression of the bucket cylinder;

a bucket lever instructing an extension and compression speed of the bucket cylinder;

09/814,099

a bucket lever operating amount detector detecting an operating amount of the bucket lever;
and

a controller outputting a boom control command value to the boom control valve on the basis
of the boom lever operating amount input from the boom lever operating amount detector, and
outputting a bucket control command value to the bucket control valve on the basis of the bucket
lever operating amount input from the bucket lever operating amount detector, wherein;

said working unit control apparatus has excavating state detecting means detecting an
excavating state of a vehicle,

said controller has a load judging portion judging on the basis of a detecting amount input
from the excavating state detecting means whether or not the vehicle is under excavation, an
operating amount change judging portion judging that the boom lever operating amount changed to
a zero amount from a predetermined operating amount, and automatic excavation control means
setting and outputting an automatic excavation command value to each of the control valves on the
basis of the judgment of said load judging portion and said operating amount change judging portion,

the automatic excavation control means outputs the automatic excavation command value
to each of the control valves when said load judging portion judges that the vehicle is under
excavation and said operating amount change judging portion judges that the boom lever operating
amount changes from a predetermined operating amount to a zero amount, the excavating
state detecting means is constituted by a vehicle speed detector detecting a vehicle speed and an
engine rotational speed detector detecting an engine rotational speed, and

[wherein] the load judging portion is structured such as to judge that the vehicle is under
excavation when the vehicle speed is equal to or less than a value shown by a predetermined curve

09/814,099

relating to the engine rotational speed.

13. (Amended) A working unit control apparatus of an excavating and loading machine [as claimed in claim 11] comprising:

a boom cylinder controlling a lift of a boom;

a boom control valve controlling extension and compression of the boom cylinder;

a boom lever instructing an extension and compression speed of the boom cylinder;

a boom lever operating amount detector detecting an operating amount of the boom lever;

a bucket cylinder controlling a tilt of the bucket;

a bucket control valve controlling an extension and compression of the bucket cylinder;

a bucket lever instructing an extension and compression speed of the bucket cylinder;

a bucket lever operating amount detector detecting an operating amount of the bucket lever;

and

a controller outputting a boom control command value to the boom control valve on the basis of the boom lever operating amount input from the boom lever operating amount detector, and outputting a bucket control command value to the bucket control valve on the basis of the bucket lever operating amount input from the bucket lever operating amount detector, wherein;

said working unit control apparatus has excavating state detecting means detecting an excavating state of a vehicle.

09/814,099

said controller has a load judging portion judging on the basis of a detecting amount input from the excavating state detecting means whether or not the vehicle is under excavation, an operating amount change judging portion judging that the boom lever operating amount changed to a zero amount from a predetermined operating amount, and automatic excavation control means setting and outputting an automatic excavation command value to each of the control valves on the basis of the judgment of said load judging portion and said operating amount change judging portion,

the automatic excavation control means outputs the automatic excavation command value to each of the control valves when said load judging portion judges that the vehicle is under excavation and said operating amount change judging portion judges that the boom lever operating amount changes from a predetermined operating amount to a zero amount,

the excavating state detecting means is constituted by an accelerator pedal operating amount detector detecting an accelerator pedal operating amount and an engine rotational speed detector detecting an engine rotational speed, and

[wherein] the load judging portion is structured such as to judge that the vehicle is under excavation when the accelerator pedal operating amount is equal to or more than a predetermined operating amount and the engine rotational speed is equal to or less than a predetermined rotational speed.